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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,171	10/06/2003	David Joseph Kropaczek	8564-000019/US	2280

33727 7590 03/23/2004

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EXAMINER

RICHARDSON, JOHN A

ART UNIT PAPER NUMBER

3641

DATE MAILED: 03/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/678,171

**Applicant(s)**

KROPACZEK ET AL.

**Examiner**

John Richardson

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 4-6, 14 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Non Final Rejection***

1). The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2). The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3). The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4). The disclosure is objected to because of the following informalities:

- The disclosure specification uses the term **reactor** to describe the applicant's invention. It is clear that the invention is in the **nuclear reactor** art and the specification needs to be written accordingly to avoid any confusion with other types of reactor apparatus, such as chemical reactors

Appropriate correction is required.

5). Claims 1-14 are objected to because of the following informalities:

- Claim 1, line 1 states "Method of operating a **reactor** core". This should be changed to read to "Method of operating a **nuclear reactor** core". It is noted that claim 14, line 2, includes the limitation **nuclear reactor operation**.

Appropriate correction is required.

6). Claims 15-18 are objected to because of the following informalities:

- Claim 15, lines 1, 4, 6, 7 state "Method of operating a **reactor** core". This should be changed to read to Method of operating a **nuclear reactor** core"
- Claim 18, line 3, states the limitation of **reactor** core; this should read **nuclear reactor** core.

Appropriate correction is required.

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7). Claims 2, 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "**optimal in-cycle**" in claims 2, 16 are a relative term which renders the claim indefinite. The term "**optimal in-cycle time**" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is the examiner's position that for example, **optimal in-cycle time** could relate to a) fuel burn-up time, b) time period of the refueling cycle.

8). Claims 1, 3, 10, 11, 13, 15, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe (JP 6-0013283 – see translation).

The reference discloses a method of nuclear fuel management for BWR type nuclear reactor comprising an initial operating plan with a multiplicity of fuel cycles (1st, 2nd, and equilibrium), the management plan incorporates the movement / shuffling of fuel assemblies within the reactor core (see pages 12, 13), and states in particular on page 10, last paragraph, of the translation that fuel assemblies are repositioned and reused in / during a fuel cycle; it is the examiner's position that BWR nuclear reactors by definition require shutting down the reactor core for refueling operations. The reference also states that the said operating plan provides for energy output advantages by increasing

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fuel burn-up residence time by about 10% (see translation page 8, last line, page 9, first line) and has economic superiority – total revenue (see translation page 4, last line, page 9, 2<sup>nd</sup> line). Relating to claims 3, 17, the reference discloses a fuel shuffling strategy (see translation, for example, Figures 5-8), relating to claims 10, 11, the reference discloses replacement with new fuel assemblies (see translation, page 13, relating to claim 13, the reference includes the repositioning of fuel assemblies in / during a cycle (see page 10, last paragraph).

9). Claims 1, 3, 10, 11, 13, 15, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Congdon et al (WO 92/01288).

The reference discloses a method of nuclear fuel management for BWR type nuclear reactor comprising an initial operating plan with a multiplicity of fuel cycles (1st, 2nd, etc, Figure 3), the management plan incorporates the movement / shuffling of fuel assemblies within the reactor core (Figure 2), and states on page 9, first paragraph, that fuel assemblies are repositioned and reused in / during a fuel cycle; it is the examiner's position that BWR nuclear reactors by definition require shutting down the reactor core for refueling operations. The reference also states that the said operating plan provides for more efficient fuel utilization / total energy output / economic - revenue advantage (page 5, lines 19-23), relating to claims 3, 17, the reference discloses fuel shuffling

strategies (Figure 3), relating to claims 10, 11, the reference discloses the movement of a plurality of fuel bundles (Figure 3) including new / fresh fuel (step 301).

10). Claims 1, 3, 7 -13, 15, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolters et al (U.S. 5,272,736).

The reference discloses a fuel management plan for reloading fuel bundles in a BWR nuclear reactor core that by means of 'power shaping' fuel bundles at specific core locations achieves overall power exceeding that conventionally attainable (see Column 7, lines 3-14) with commensurate increases in revenue generation as a function of fuel burn-up residence time in the reactor core. It is the examiner's position that in accordance with the applicant's statements in the specification page 1, [0001] and [0002] that the nuclear reactor is licensed by the U.S. Nuclear Reactor Commission (NRC), that for compliance with the regulations for commercial power reactors, Title 10 CFR Part 50, Appendix A –General Design Criteria- it is implicit in the NRC license that any fuel management scheme meets the requirement for a reactor shut-down during the fuel cycle to meet unexpected core fuel performance to bring the reactor to shutdown conditions followed by removal of damaged fuel and replacement with new / repaired fuel before reactor restart, relating to claims 2, 16, the term "optimal in-cycle time" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention; it is the examiner's position that for example, **optimal in-**

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**cycle time** could relate to a) fuel burn-up time, b) time period of the refueling cycle. relating to claims 3, 17, the reference discloses fuel shuttling strategies (see for example, Figure 4), relating to claims 10, 11, the reference discloses a plurality of fuel replacements including new fuel, and relating to claims 7 - 9, 12-13, the reference discloses that repaired fuel can be used including re-assembly of fuel in a fuel pool (Column 11, lines 43-45, Column 12, lines 5-12, lines 41-43. It is the examiner's position that the claimed invention is disclosed by the reference except for the citation that fuel cycle includes in-cycle shut-downs. It would have been obvious to one having ordinary skill in the art at the time of the invention since it is well known in the art that NRC licensed reactors are required to be able to shut-down and remove and reload damaged fuel at any time in a fuel cycle.

11). Claims 4-6, 14, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12). The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



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13). Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Richardson whose telephone number is (703) 305 0764. The examiner can normally be reached on Monday to Thursday from 7.00 AM to 4.30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306 4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 305 7687.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 1113.

John Richardson, PE,

March 18 2004.

  
MICHAEL J. CARONE  
SUPERVISORY PATENT EXAMINER